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# How Shall We Keep Our Food Cold?

By HELEN BISHOP

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The time is with us now when there is more interest than there has been in the past few months in how to keep food cold, both for the sake of economy and for palatability. The question is, What is the best method of keeping food cold? Refrigerators are being used more and more for this purpose for at least two reasons: they save the many, many steps which must be taken if the food is kept in a cool cellar or well, and they can be much more easily regulated as to temperature and dryness. We have learned to appreciate cool drinks and crisp vegetables on hot days so that the lack of ice as a means of making foods palatable would be a real hardship for many people, but the greatest value of a means of refrigeration comes in the enormous amount of food that can be saved by its use and the transportation of foods to far parts of the country.

Spoilage of foods is caused by bacterial action. Bacteria grow and develop wherever there is moisture, warmth and food pleasing to this form of plant life. The foods which we like often are what are most pleasing to bacteria, too. Therefore it becomes a race as to which gets it first. If we can keep our food in a form which is not favorable to bacterial growth, we can save it for ourselves. Keeping it cool and dry will accomplish this best.

Whether a refrigerator is the best means by which the housewife may keep food in good condition or not and whether the cost of the refrigerator will pay for itself in the time, energy and food saved and increased enjoyment in meals, is for the family to decide. If the decision is in favor of the refrigerator, there are several important things to remember in selecting it. The outside finish and general attractiveness of appearance, the manufacturer says, is what is of most interest to women purchasers, but there are other things to look for. Is it easy to clean? Smooth surfaces, rounded corners, absence of cracks, easily removed shelves and accessibility to drain pipe, all help in shortening time and effort of cleaning. Is it the right size to hold the amount of food which it is bought to cool? If it is too small and is filled to overflowing with food, air cannot circulate through it as it should and the temperature will not be uniformly low through the box. If it is too large, ice will be required to keep unused space cool so that the expense of icing will be higher than is neces-



Mechanically Cooled Refrigerator.

sary. Whether it is a side or top icing box is a good deal a matter of choice except that the larger boxes are almost always made so that the ice is put in from the front, while the smallest boxes have the door at the top, but there are a number of medium sized boxes of both styles which give this chance for choice. If the refrigerator can be iced from outside, much dirt from wet feet and dripping ice can be kept out of the house. The box with the two icing doors is a little more expensive than with one. Both when the refrigerator is new, and always during its use, be sure that the doors fit tightly. They can be tested by shutting a piece of paper in the door and then pulling it to see if it will slip at any place. Strips of felt lining can be tacked along the edges to make a closer fitting for a door that has loosened with use. Also, the screws may be tightened or the hardware moved slightly to make a tighter seal.

Is there good circulation through the box? This depends not only upon the construction of the box, whether the openings below and above the ice are large enough for continuous circulation, whether the shelves are of wide meshed wiring or similar material to allow for free passage of air, but also a great deal depends on the way the box is used. If foods are placed on and all around the ice, if the ice is wrapped up so that it is kept from melting, cir-

culatation of air cannot be very great, for there is little chance for any air being cooled, and circulation depends upon the mingling of warm and cool air, which is caused by the cold air falling and pushing up the warm air.

It is because of this circulation that we find the compartment or shelf directly under the ice is the coolest part of the refrigerator and milk and other foods requiring special care should be put there. Foods of strong odors, such as cantaloupes, bananas and cabbage, should be wrapped and then placed on the shelves where the air passes last before going to the ice chamber. If these odors are absorbed they then may be deposited with the moisture on the cold refrigerant when the air laden with the extra moisture which warm air can hold, reaches the ice box again. In this way there is less chance for contamination of all the food in the box.

Besides knowing what to look for in selecting a refrigerator, it is essential to know how to care for it. A small

amount of frequent care saves time and keeps the box in better condition than more time at larger intervals. There should always be a weekly cleaning, when the box is washed with lukewarm or cool water containing soda, rinsed and dried. This last step is one often omitted and is important, since moisture is one of the essentials to bacterial growth. The drain pipe needs especial attention and is easily neglected. A brush with a long, flexible handle is probably the greatest aid in this cleaning in a refrigerator which does not have a jointed drain pipe. Besides the use of the brush, flushing the pipe with hot soda water is also important. Of course, immediate wiping up of spoiled food is necessary to a sanitary box.

A series of excellent bulletins on refrigerators is issued by the National Association of Ice Industries, which can be secured by writing to them at 103 W. Washington St., Chicago. The series includes, "Where to Place Food in the Household Refrigerator," "The Care of the Home Refrigerator," "The Care of the Child's Food in the Home," and several others of equal value.

Recent developments in the process of ice brings it within the reach of most people now-a-days who live sufficiently near even small communities in which it is made or to which it can be shipped. The machinery used in this manufacture can be quite complex, but

the principle of the freezing is easy to understand. Water is placed in large cans holding from 300 to 400 pounds, and is surrounded usually by a very cold brine. Because of the exchange of heat between the brine and the water, the water becomes colder and colder and the brine warmer. Since the brine at first was much below the freezing point of water, by the time the temperature is about the same in both brine and water, the water has frozen into ice. The method by which the brine is brought to this low temperature is by bringing it into contact with ammonia liquid under pressure. When this pressure is gradually reduced it has the chance to become a vapor, but this requires heat. This heat it takes from the brine and as this happens at a very low temperature, the brine becomes quite cold—probably 10 to 15 degrees below the freezing point of water.

Whether it is wiser to use ice as the means of cooling or some other substance, which, like ice, takes heat from whatever is near it in changing from one state to another, is a question of growing interest right now. Last year there were more refrigerators with mechanical units sold during the first seven months of the year than the total number sold in all the years before. This year bids fair in excelling that of new kinds on the market and record because the number of new kinds on the market and the improvement of old models is most noticeable, and evidently the manufacturers feel their product is likely to become more and more popular.

While refrigeration by other substances than ice has been used in commercial cold storage plants or where there was need for much use of low temperature, it has not been done in households until comparatively recently. This was due in part to the fact that an ammonia gas plant requires careful handling by trained people, such as most housewives were not able to give it. Now other substances are used with seemingly great satisfaction and the manufacturers of so-called "electric refrigerators" are beginning to spring up in legion. The principle is the same as that used in the manufacture of ice on a large scale. The temperature is reduced by allowing some substance like ammonia, which has a low vaporizing point, to change from a liquid to a vapor, taking up heat from anything near (in this case the air circulating through the refrigerator) and thus cooling it. The vapor is then passed into a condenser and here the electric motor comes into play, for it furnishes the power which compresses the refrigerant into a liquid again. Another part of the mechanism is the cooler coils through which the warm liquid is cooled by the passage of air about the coils. The

motor and the coils can be placed in the space below the refrigerator unit or they can be placed below in the basement where the noise of the motor isn't so noticeable. There is always a thermostatic control, which regulates the flow of the refrigerant and there-



Refrigerator Showing Food Placement.

fore the temperature within the refrigerator.

This season there is being put on the market a refrigerating unit which sounds paradoxical—the low temperature is obtained by means of burning gas. The method is something the same as that of the electric motor method in that the cooling is done by the circulation of a substance which vaporizes at a very low temperature. The substance is mixed with water and on being heated goes to a condenser and then to the refrigerator to expand and vaporize and cool the box, after which it is mixed with water and the process goes on again. This, too, is regulated by a thermostat. This is probably only one of the modifications of mechanical refrigeration which we will be seeing on the market in the near future.

The comparative cost of an iced refrigerator with one mechanically cooled at first glance argues in favor of the better known iced one, but the operating costs on the mechanical one over a period of years show considerable less expense for those mechanically operated. Figures available from two families of about equal size and averaging equal expenses in other items of the household, show that over a period of two years the operating costs of the electrically operated refrigerator ran from one-third to one-fourth of that spent by the people us-

ing ice as the refrigerant. These figures are based on ice at \$6.00 per thousand pounds and electricity at 2½ cents per kilowatt hour. In this case when the ice bill was \$6.00 per month, the cost of electricity would be from \$1.50 to \$2.00. The various prices paid for ice and electrical power in different communities would, of course, influence this ratio considerably.

Because there is space left below the food compartment for the coils and motor, in the boxes built for mechanical refrigeration, the boxes are usually at a better height than other boxes. They do away with the extra effort needed in cleaning and placing and removing food in the boxes which stooping and reaching cause. This good point found in these newer boxes came probably from meeting the other requirements rather than in planning to make work lighter for the user, but is a worth while one to consider, nevertheless.

The refrigerator the housewife buys should be purchased with all these points in mind. She must consider her purchase from all angles.

With all the interest and activity in finding for us varied and improved equipment for cooking our food, there will doubtless be found something to meet the many needs and pocketbooks of the housewives of the land which will aid their work. It should bring them opportunity to serve more healthful and pleasing meals and thereby increase our national well being.

## Man-Cooked Meals

### Are Present Vogue

Mere man has succumbed to the lure of the baking tin and the frying pan, according to Miss Kathleen Atkinson, home service director, Providence Gas Company, Providence, R. I.

"Come out of the kitchen, Mary," is to be more than a mere slogan, or, in some cases, mere sarcasm, for in Providence the men have petitioned for cooking classes for men. They have asked that they be instructed in the art of broiling, baking, basting, etc., and they are timid about entering classes in which the women predominate.

Miss Atkinson said that this is no sign of the collapse of the he-man of the Western prairies or that men will do all the cooking in the future, but she does claim that it will prove of value in maintaining the home, now that women have entered the commercial, professional, and political fields.

Abe—"Vot did you name the twins?"

Ike—"The foist vons we called 'Kate and Duplikate.' Then we had 'Pete and Repete.'"

Abe—"And the new vons?"

Ike—"Max and Climax.' Oy! Oy! I hope so!"